

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-19 (canceled)

- 5      Claim 20 (new): A photonic input/output device, comprising:
- (a) a layered structure comprising an unpatterned substrate having at least one layer and at least one additional layer on top of the unpatterned substrate, one additional layer on top of the unpatterned substrate,
  - (b) a coupling region that is within the at least one additional layer and that comprises an arrangement of at least one optical scattering element, and
  - (c) at least one output waveguide, wherein the at least one optical scattering element has an index contrast that is greater than or equal to approximately 1.

10     Claim 21 (new): The photonic input/output device of claim 20, further comprising a second output waveguide arranged to be approximately orthogonal to said at least one output waveguide.

15     Claim 22 (new): The photonic input/output device of claim 21, wherein said at least one optical scattering element is a diffraction grating structure.

20     Claim 23 (new): The photonic input/output device of claim 22, wherein said diffraction grating structure is a two-dimensional grating.

Claim 24 (new): The photonic input/output device of claim 23, wherein said at least one optical scattering element is at least one cylindrical hole.

5       Claim 25 (new): The photonic input/output device of claim 23, wherein said at least one cylindrical hole is an array of holes comprises one of a purely periodic grating pattern and a substantially periodic grating pattern.

Claim 26 (new): The photonic input/output device of claim 21, wherein the said at least one output waveguide and said second output waveguide comprise ridge waveguides.

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Claim 27 (new): The photonic input/output port of claim 24, further comprising an output boundary between said coupling region and said output wave guides, wherein the arrangement of at least one optical scattering element comprises two or more optical scattering elements and the volumes of the scattering materials gradually decrease as they 15 approach the region near said approximately orthogonal output waveguides.

Claim 28 (new): The photonic input/output device of claim 20 wherein the unpatterned substrate serves as a reflector.

20      Claim 29 (new): The photonic input/output device of claim 28 wherein said unpatterned substrate serving as a reflector comprises a distributed Bragg reflector.